

Comparative Histological Study Vagus Nerve in Different Parts of Body on the Rabbits

M.M. Salech

Department of Anatomy, Veterinary College, Mousal University, Mousl, Iraq

Abstract: Through studying of vagus nerves in rabbits, histological compound observed that contain myelin nerve fiber but can be found variation percentage of different region of body, and non-myelin nerve fibers with different shapes of nucleus of the schwann cell depended on the area of nerve and function of the vagus nerve.

Key words: Vagus, nerve fiber, myelin, non-myelin, rabbit

INTRODUCTION

Vagus nerve is very important for the cranial nerves because of the systemic nerve, it contains motor and sensory nerve fiber, sympathetic, parasympathetic. It can be divided in three parts 1-cervical part 2-thoracic Part 3- and different branches in the abdominal cavity (Mekalov, 1970).

Nerve trunk formed from myelin and non -myelin nerve and these nerves fiber accumulated to form many endoneurium surrounded by connective tissues with perineurial layer then surrounded by Collagen fiber which called Epineurial (Banks, 1981; Sunderland, 1965).

The function of the nerves trunk determined by the types of the nerves fiber. But also types of the organ innervations for-example; muscle innervated by nerve trunk contain myelin nerve fiber type large (Aipsan and Sal, 1981).

Axon nerve trunk compound schwann cell that it contains nucleus in the nonmyelin nerve fiber, In case shape nucleus oval this nerve sympathetic but in case like cigarat the nerve fiber parasympathetic nerves (Vorobev, 1958).

Nerves trunk not only determined by type nerves fiber but also by degree development connective tissues and type cell and fiber and blood vessels (Kadegev *et al.*, 1992).

This study on the Rabbit has been undertaken to reveal the histological variation of vagus nerve of different parts of in the body, which all have crucial role with regard to their sympathetic and parasympathetic system.

MATERIALS AND METHODS

A number of 10 adult local rabbits (different sex) were used in this study. After removal vagus trunk from (cervical, thoracic cavity branches of abdominal cavity)

Fixation with 12% neutral formalin, embedding in wax and section cut by microtome and stained by a-van-Giesons stain-massons trichrome stain. Examined with Microscope.

RESULTS

The histological compound of vagus nerve was clear variation depended on the local and type of the organ innervation's.

The variations compound were observed of the contain myelin and non myelin nerve fiber in different region.

Cervical region: The vagus nerve was characterized histological compound different between the upper and lower part of cervical region.

In the upper part of cervical region vagus nerve which characterized the Epineurium contains only one of the Endoneurium it was large size in most of epineurium as showed (Fig. 1a), each endoneurium contains myelin and non-myelin nerves fiber (Fig. 1b). The nerves fiber which contain of non-myelin nerve fiber that schwann cell nucleus as oval shape while in the perneurium contain small amount of collagen fiber.

In the lower part of the cervical region the vagus nerve near of the thoracic inlet the Epineurium is large in comprise with the upper part (Fig. 2a). One of Endoneurium contains a large amount of non-myelin that nucleus oval and similar to cigarette shape and small amount myelin nerve fibers as (Fig. 2b). Perneurium well developed and contained blood vessel and large amount collagen (Fig. 2b).

Thoracic cavity: Vagus nerve in the thoracic cavity can be found differences types in shape of histological compound depended on the location the nerves.

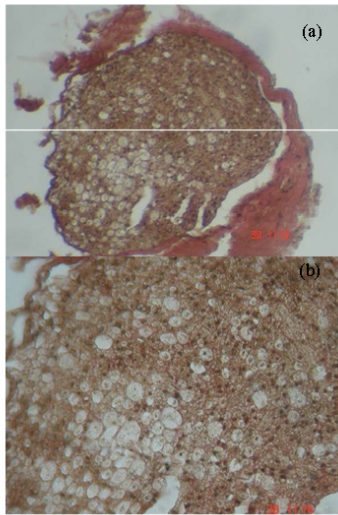


Fig. 1: Upper part vagus of neck, stained van-Gieson stain (a) x20 (b) x40

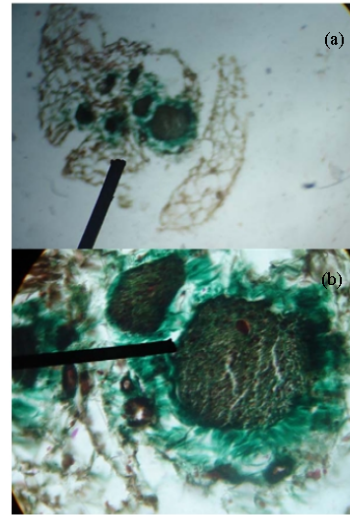


Fig. 3: Upper part vagus nerve of the trachea, stained Masson's-trichrome (a) x20 (b) x40

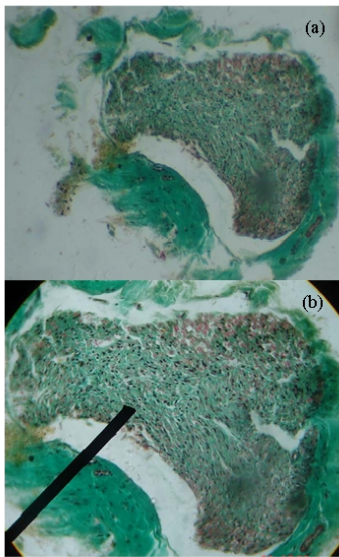


Fig. 2: Lower part vagus of neck, stained Masson's trichrome stain (a) x20 (b) x40

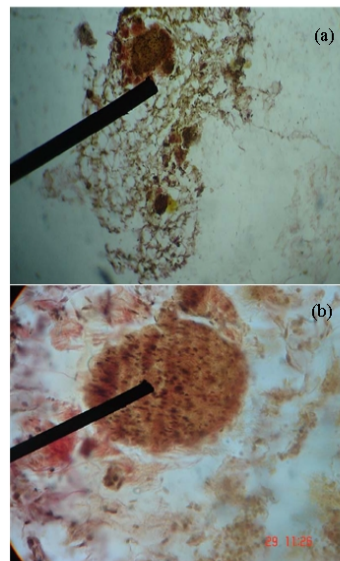


Fig. 4: In bifurcation of the trachea vagus nerve stained van-Gieson (a) x20 (b) x40

One-upper part of the trachea was characterized contain of the Epineurium (6-7) of the endoneurium and different size (Fig. 3a). In all endoneurium contain large amount non-myelin nerve fiber that schwann nucleus oval shape as it appears in Fig. 3b and small amount of myelin nerve fiber.

In perineurium we found that a large amount of collagen fiber and blood vessel (Fig. 3b).

In bifurcation of the trachea of the histological compound of vagus nerve was found decrease number of the endoneurium (Fig. 4a). One or two and after that in perineurium was observed of large amount of collagen fibers and fibroblast (Fig. 4b). In the endoneurium contains nerve fibers that schwann cell nucleus that oval and similar cigarat shape (Fig. 4b).

After divide the vagus into two parts dorsal and ventral esophageal trunk, these trunk charities of the epineurium contain one large size endoneurium (Fig. 5a), non-myelin nerve fiber that nucleus similar cigarat and small number of oval shape and increase number of myelin nerve fiber compare this in region bifurcation of trachea (Fig. 5b). In perineurium observed different connective tissues (Fig. 5b).

Abdominal cavity: The branches of the vagus nerves, in the abdominal cavity can be observed different shapes.

In one branch the epineurium contains one large almost of the epineurium these endoneurium (Fig. 6a) and

type nerve fiber in these endoneurium my be found myelin and non-myelin nerves fiber that nucleus similar cigarat and small of oval shape of schwann cell (Fig. 6b).

In second branches the perineurium contain endoneurium very large (Fig. 7a) endoneurium contain non-myelin nerve fibers that oval shape nucleus schwann cell large number and myelin nerve fibers (Fig. 7b).

In other branches vagus trunk (Fig. 8a) was obtained that endoneurium that large size and contain non-myelin nerves fiber that oval shape nucleus schwann cell and small number similar cigarat and myelin nerves fiber. In endoneurium contains symphatic ganglia cell (Fig. 8b).

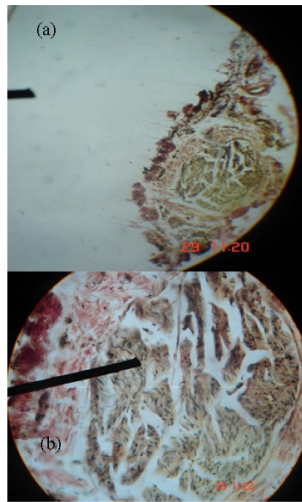


Fig. 5: Dorsal and ventral esophageal trunk stained van-Giesons (a) x20 (b) x40

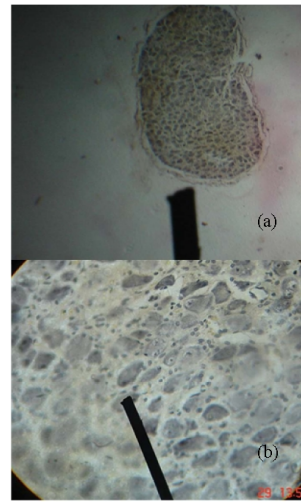


Fig. 7: Second branches of vagus nerve abdomen cavity stained van-Giesons (a) x20 (b) x40

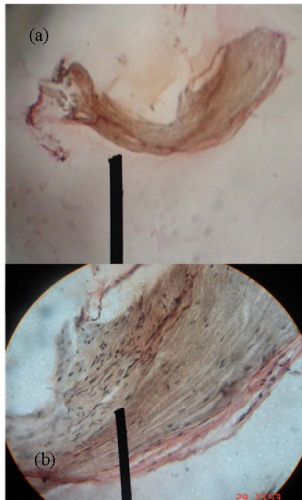


Fig. 6: Branches of vagus nerve abdomen cavity stained van-Giesons (a) x20 (b) x40

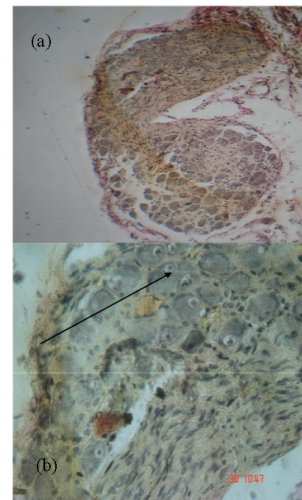


Fig. 8: In branches of vagus nerve abdomen cavity stained van-Giesons(a) x20 (b) x40, black arrow; symphatic ganglia cell

The result of histological compound of the vagus trunk in rabbit can be found different phases depended on location the branches and percentage of myelin and nonmyelin nerves fibers was be found in different places of the body.

DISCUSSION

The aim of this study reveals of the role of these nerve in the different parts of the body of rabbits but the, histological compound of vagus nerve can be found in different compound and these results show the vagus nerve sympathetic and parasympathetic nerve function.

This study observed variation of percentage of myelin nerve fiber of the vagus nerve of the rabbits were increase of neck and abdomen cavity and decrees in the thoracic cavity and similar of study the vagus nerve in the human (Nikulin, 1985).

The nerve trunk in rabbit characterized the epineurium contains small number and small size of endoneurium (Plognek, 1978) in present study were found of vagus in almost epineurium contains one of the endoneurium and in large size.

In the epineurium does not only contain endoneurium but in perineurium contain connective tissues and development of connective tissues depended on the number of size endoneurium (Jeffery *et al.*, 1995), but in this study, we found that the obtain connective tissues which development in the thoracic cavity because the number of endoneurium increase and small size but in the neck and branches of the abdomen cavity decrease development connective tissues because contain one of endoneurium and large size. At the end of the results show the function of the nerve determined by size of endoneurium in the neck and branches of abdomen cavity is larger in size and this reveals the vagus nerve is more impartment in this region, but in the thoracic cavity the histological compound of the vagus nerve in is less

development and I think that this decrease is important in this region and this result is similar to the study of (Dyce *et al.*, 2002).

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